EMERGING SOLID WASTE ISSUES AND TRENDS

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ASTSWMO Solid Waste Managers Conference
July 12-14, 1999

INTRODUCTION

Before starting my presentation, I want to thank everyone for the opportunity to participate in this year's State Solid Waste Managers Conference. I especially want to thank Lakshmi Sridharan and the members of her Conference Planning Task Force for pulling together such a rich conference agenda. Congratulations to Lakshmi and the Planning Committee!

The topic of my talk today is emerging issues and trends in the field of solid waste management. I'm going to address several topic areas including: source reduction and recycling; solid waste management in landfills; the public's thirst for information; privatization of solid waste services; non-municipal, non-hazardous solid waste streams; and some emerging concepts of how we should be looking at the solid waste stream.

SOURCE REDUCTION AND RECYCLING

Source Reduction

Beginning with source reduction, I would expect that there will be an increased emphasis on design for the environment. Products such as copying equipment, computers, and other electronic equipment will be designed so that major components can be reused in future generations of these same products. It is possible that the States and the Federal government will be lobbied vigorously to establish bans on disposal of certain types of products such as electronic equipment which will provide even more incentive for manufacturers to design products with reuse in mind.

I would also expect that local governments may intensify efforts to educate the public on the benefits of back yard composting. The cost of public education programs is considerably less to local governments than the cost of collecting yard

waste and processing it into compost. Thus, there is an economic incentive to promote back yard composting of both yard waste and food residuals.

With more and more people reaching retirement age and volunteerism on the rise, there should be an increased opportunity to use excess food to feed the hungry. Additionally, rather than throw out food that may no longer be suitable for human consumption, there is a growing trend to use food scraps from food distribution centers, restaurants, and grocery stores to feed animals. This trend should continue well into the future and provides the opportunity to reduce the amount of waste requiring disposal.

Recycling

I predict that recycling rates will continue to increase, and I think the rates will go up rather substantially over the next decade. Yard waste and food waste make up almost 25 percent of the material that is currently going to landfills and incinerators. This, coupled with contaminated paper, represents a huge quantity of material (over 37 million tons per year) that can be readily recycled into compost at a cost that should be quite competitive with disposal. Additionally, markets for compost remain very strong.

Our Division has been doing work on ways to make recycling more cost-effective. We have conducted extensive studies of 20 communities with recycling rates ranging between 40 and 65 percent. Our analyses show that many of these recycling systems are more cost-effective now than when they did not operate recycling programs or operated at lower recycling rates. Our analysis indicates that this is due largely because these communities include composting programs in their recycling programs, collect many non-standard items (such as textiles and mixed paper), have optimized their collection frequencies by reducing one trash pick-up per week and replacing it with a recyclables pick-up, operate both drop-off and curbside collection programs, and rely on pay-as-you-throw pricing systems to provide an economic incentive for citizens to reduce waste and to recycle.

We have also found that corrugated paper production has increased significantly over the last couple of years. This has certainly been influenced by our vibrant economy, but may also be influenced by the increase in home shopping via the INTERNET, catalogs, and cable TV. Because markets for corrugated are always usually pretty good, this suggests that curbside or drop-off collection of corrugated cardboard may prove fruitful in increasing recycling rates cost-effectively.

MUNICIPAL SOLID WASTE LANDFILLS

The agenda of this conference covers what I expect will be the significant issues related to municipal landfills.

Leachate Recirculation

Over the last year, we have noticed a substantial increased interest in leachate recirculation and the use of bioreactor landfills among solid waste practitioners within State and local governments and within the waste management industry. The Solid Waste Association of North America has formed a Task Force to promote the use of this technology. It is quite possible that proper design and operation of bioreactor landfills will improve the efficiency of landfill gas utilization and improve landfill performance in terms of leachate quality both during operation and after landfill closure.

We are currently working with SWANA, our Region IX office, the State of California, and Yolo County, California, on a project to identify barriers to the use of bioreactor landfills. The goal is to provide any necessary regulatory relief and identify and quantify the environmental and economic benefits of bioreactor landfills. We are also working on a Notice of Data Availability

that we will share with ASTSWMO's Solid Waste Task Force that requests comment on a revision to the MSWLF criteria that would allow leachate recirculation in units designed with alternative liner designs. Our current regulations allow leachate recirculation only when a composite liner is present.

Final Cover Designs

Another area that is receiving considerable attention is alternative final cover designs, particularly in arid locations. We have heard claims that the final cover design specified in our landfill criteria may not work in arid locations. To date, we have not received any formal correspondence or petition to modify our regulations,

but I am interested in this afternoon's session on alternative final covers to get a better understanding of the issue.

Long-term Care

Increasingly, we have heard references made to municipal landfills as "ticking time bombs" and that "dry tomb" landfills are not safe over the long term. On the other hand, we have also heard that today's landfills are the "safest and best in the world." We are interested in gathering data on how leachate quality changes over time to better prepare ourselves to address any issues related to long-term performance of landfills.

INFORMATION

The public is ravenous for information of all types. I would expect that this trend will continue into the future. Government at all levels may be faced with additional demands for "right-to-know" legislation aimed at providing additional information on such things as the cost of waste services, landfill leachate and ground water quality data, actual recycling rates, the degree to which manufacturers are using recycled materials in the products they make, interstate and international shipments of waste, and other information related to solid waste management. We may want to be working together to share information on citizen "right-to-know" legislation that is being drafted by State and Federal legislators. This may help prepare us if the need should arise to develop a strategy for dealing with increases in requests for various kinds of information that is currently not readily available at the State or Federal level.

PRIVATIZATION

There is a growing trend in solid waste management to privatize waste management services. This has been shown to yield cost savings in some instances. However, if not done properly, it could have long-term ramifications that could be counter-productive to increased source reduction and recycling. To avoid this, I think it is necessary for government to continue to take responsibility for specifying the type of services being delivered by the private sector. To illustrate my concern, I'll share a possible scenario. Suppose a local government finds it can increase its recycling rate from 25 to 35 percent by making a capital investment of $10 million

dollars, while maintaining unit costs at $20 per household per month. They are able to do this through increased efficiencies resulting from the capital expenditure.

We in the public sector may be quite content to make this investment in increased recycling even though our program's annual costs and revenues would remain exactly the same. However, I am not sure that the private sector would be as willing to make a large capital investment that yielded no net increase in revenues or profits. The return on this investment would be zero, and make this investment very difficult to explain to investors. It would be easier to explain to shareholders if the investment was necessary to maintain market share and to ensure that the company did not lose a contract to a competitor. For this reason, I believe that privatization requires careful attention on the part of government to ensure that both the environment and the customers are being properly served.

NON-MUNICIPAL, NON-HAZARDOUS SOLID WASTE

For a number of reasons, I think that many of us will be spending considerably more time on dealing with non-municipal, non-hazardous wastes over the next decade. First, clean-up of environmental insults resulting from the extraction of raw materials from the earth are costing huge sums of money, much of which is being paid for by taxpayers. Citizens will increasingly become aware of this fact and are likely to seek additional controls on these industries to ensure that they are not faced with these kinds of costs in the future. Second, there is still a major effort within EPA at finding ways to allow hazardous wastes that are shown to pose minimal risks to exit the hazardous waste system. This will cause increased scrutiny on where and how these exiting wastes will be managed. And third, there are no comprehensive Federal regulations that address non-municipal, non-hazardous wastes. As we complete the activities related to the hazardous waste regulatory framework, it is just human nature that the broad universe of industrial non-hazardous waste will undergo further scrutiny. And finally, there will always be a sub-set of society that will not be satisfied with the fact that a comprehensive set of Federal regulations is not in place.

EMERGING CONCEPTS

Extended Producer Responsibility

Germany and the rest of Europe started a revolution in the way the developed world thinks about waste. They made product manufacturers responsible for taking their products back after being discarded. The goal was to reduce the public costs of waste management and create an incentive for manufacturers to make products that are less wasteful and more recyclable. This trend shows no signs of diminishing and is now being implemented in Canada, Korea, and Japan. South America is showing a growing interest in "Extended Producer Responsibility" as well.

One thing is clear -- waste prevention and recycling of some components of the waste stream cannot advance beyond where they are today in a cost-effective manner without serious changes in product design. To conserve certain resources in this country, product makers have the central role -- no other part of the product chain has as much leverage over the design, materials

used, and function of products.

Manufacturers must take their obligations seriously to (a) design their products to create as little waste as possible and to be readily recyclable; (b) help make a market for materials collected as waste; and (c) strongly entertain the notion of taking back and reusing old products as a new business strategy.

We are advocating that all stakeholders take a careful look at the product chain and determine who is best suited to performing the specific functions necessary to increase the efficiency of our use of raw materials: designers, manufacturers, suppliers, distributors, retailers, customers, and waste managers. To be most cost-effective, we believe this responsibility should be shared, but it is clear that product manufacturers have a major role to play in this equation.

EPA is funding a number of projects which bring various stakeholders together to develop strategies for improving the way we produce, reuse, and recycle such products as transport packaging, plastic bottles, materials used in direct mail, and electronics. It is our view that manufacturers have a strong incentive to participate in programs that reduce the amount of materials that must be managed as waste, or they may be faced with legislation that they could find quite onerous, such as product take-back mandates similar to those now in effect in Europe.

Industrial Ecology

Industrial ecology is a growing field that involves systematically examining local, regional, national, and international uses and flows of materials and energy in products, processes, industrial sectors, and economies. It focuses on the potential role for industry in reducing environmental burdens throughout the life cycle of a product. Among other things, it encompasses (a) material and energy flow studies, (b) life-cycle planning, design, and assessment, (c) design for the environment, (d) extended producer (or product) responsibility, (e) eco-industrial parks, and (f) eco-efficiency.

Industrial ecology has a longer term focus than most pollution prevention management approaches. It seeks cooperative and non-adversarial interaction, and is centered on understanding the "big" picture, not only individual parts. Industrial ecology recognizes that all environmental issues ultimately involve transformations and flows of materials and energy through the stages of extraction, manufacturing, consumer use, reuse and recycling, and disposal. Each stage affects the others. For example, patterns of consumer use have environmental consequences at the extraction stage. Manufacturing methods and design affect disposal.

Industrial ecology can focus on specific materials (e.g., mercury, lead, carbon dioxide), products (e.g., batteries, carpets, electronics), industries (e.g., autos, chemicals, metal finishing), or geographic areas (e.g., New York Harbor, the United States). We have learned that what goes on in one part of a country or the world can affect what happens in another. While EPA has conducted a number of life cycle and multimedia projects, the fact remains that most of these have generally focused on a single stage of the flow of materials with little or only limited focus on the other stages.

We are hearing from a growing number of people that a sustainable global economy is not only necessary, but that it can be achieved if we are prepared to look at the economy and environmental policy through the framework of "industrial ecology." They are advocating that EPA seek to understand environmental issues more holistically and to develop farsighted policies and programs. We are being told that if we do not adopt a broader view, significant further progress in environmental protection will be elusive and opportunities for system-wide improvements will be missed. They caution that economic, technological, and human developments at one stage of the product life cycle will overwhelm attempts to protect the environment in other stages. Their desire is that the decisions that are made today will continue to be viewed favorably 50 years from now, and that the techniques of industrial ecology can help EPA make more intelligent decisions now. The ultimate goal is to reach "sustainability," which has been defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

There are three stages of how we might view the world as having functioned in recent times. The first would tend to represent the way the world operated in the early part of this century. We had unlimited resources and did not concern ourselves too much with waste issues. This is because we also had unlimited places to dispose of the wastes generated from our daily activities. The second stage is how we are currently operating. We recognize that there are limits to the resources we have available to us and we are trying to find ways to reduce the amount of wastes that we create. The last stage would be attainment of sustainability – wastes from one activity become raw materials for another. Virtually nothing is wasted. While this last stage may never be achieved at the global level, it is already being approached on a smaller scale. An industrial sector of a small city in Denmark takes wastes from one industry to be used as inputs to other industries in the community. Taken to a global level, wastes from all waste-generating facilities in the United States and other countries would become raw materials for activities that are going on elsewhere in the United States or in some other country. Waste would be completely eliminated and all of our activities would be sustainable into the future.

I have been reading more and more in both the popular and trade press that we should be seeking to eliminate all waste, not just reduce it. I expect that over the next decade, there will be an ever-increasing call for establishing and attaining a zero waste goal.

CONCLUSION

That completes my presentation. I'm going to end my remarks exactly as I did in Williamsburg, Virginia, two years ago. We have made considerable progress in the way solid waste is managed in this country. We are all aware that there are many challenges that lie ahead. It is my hope that, working together with the States, EPA can make a contribution toward both a less costly and more protective solid waste management system for our country.